

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

DRAWINGS ATTACHED

Improved Pick Box to which a Mineral Cutting Pick is Operatively Detachably Secured

We, ANDERSON MAVOR LIMITED, formerly Anderson Boyes & Company Limited, a British Company of P.O. Box No. 9, Robberhall Road, Motherwell, Lanarkshire, Scotland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to an improved pick box to which a mineral cutting pick is operatively detachably secured, the pick box being operatively mounted on a rotary mineral cutting head or on a mineral cutting chain associated with a mineral cutting machine.

It has hitherto been known detachably to secure a mineral cutting pick to a pick box by screw-threadedly mounting a member in the pick box, the member being axially movable into engagement with a groove or recess formed in the shank of the pick, when the pick is operatively mounted to the pick box with the shank of the pick disposed within a passage formed in the pick box, thereby to restrain the pick in the operative position relative to the pick box.

The above-described construction suffers, however, from the disadvantage that, in use, dirt and corrosive liquids which are unavoidably present when a mineral mining machine is in operation tend to clog and corrode the screw-threaded interengagement between the member and the pick box and, furthermore, the time required to secure or remove a pick in or from a pick box of this construction has rendered the use of such pick boxes uneconomical in many cases.

40 With the view substantially to obviating the above-described disadvantages it has been proposed to use a resiliently deformable member, such as a body of rubber or

neoprene, disposed within a chamber formed in the pick box, the resiliently de- 45 formable member urging a locking means into engagement with the groove or recess formed in the shank of the pick.

It is the primary object of the present invention to provide a pick box of the 50 above-described type but of novel and improved construction.

A pick box according to the present invention comprises a body formed with a passage within which the shank of a mineral 55 cutting pick may be mounted, a rod rotatably journaled in a bore which is formed in the body and which is in communication with the passage, the rod presenting means by which the rod may be turned, and at least 60 one detent resiliently urged against a portion of the rod which is so formed that the rod is thereby urged towards an angular setting in which a further portion thereof protrudes into the passage for the shank of the cutting 65 pick.

In order that the invention may be more easily understood and more readily carried into effect the same will now, by way of example, be described more fully with 70 reference to the accompanying drawings in which

Fig. 1, is a side view of a pick box according to one embodiment of the invention with a mineral cutting pick mounted 75 therein, the pick box being shown in section on a line corresponding to A-A in Fig. 4;

Fig. 2, is a sectioned end view on a line corresponding to B-B in Fig. 1;

Fig. 3, is a sectioned end view on a line 80 corresponding to C-C in Fig. 4;

Fig. 4, is a sectioned plan view on a line corresponding to D-D in Fig. 3;

Fig. 5, is a sectioned end view corresponding to Fig. 3, but showing a second 85 embodiment of the invention; and

Figs. 6 and 7 are sectioned views corresponding to Figs. 1 and 4, respectively, but showing a third embodiment, of the invention in which the passage in the pick box body within which the shank of the cutting pick is mounted, and the shank of the cutting pick, are of hexagonal form in cross-section.

Referring to the first embodiment of the invention as illustrated in Figs. 1 to 4, inclusive 1 denotes a pick box body between the upper face 2 and the lower face 3 of which there is formed a passage 4. A channel 5 which communicates, with the passage 4 is formed in the lower face 3 of the body 1 and extends from one side face to the opposite side face of the body.

The passage 4 and the shank 6 of a mineral cutting pick 7 are of rectangular form in cross-section and are of such relative dimensions that the shank 6 of the cutting pick 7 may be slidably mounted within the passage 4. The head portion 8 of the pick 7 presents a mineral cutting edge 9 and protrudes from the upper face 2 of the body 1 when the pick 7 is mounted in the pick box body 1.

A bore 10, the longitudinal axis of which is disposed substantially perpendicular to the longitudinal length of the passage 4, is formed in the body 1, the bore 10 being in communication between its ends with the passage 4 along one side thereof. A rod 11 is rotatably journaled in the bore 10 and presents at one end thereof a square-sectioned projection 12 which may be engaged by a suitably shaped tool to facilitate rotation of the rod 11.

The portion of the rod 11 disposed within the portion of the bore 10 which communicates with the passage 4 is formed with a flat 13, the flat 13 being substantially diametrically disposed relative to the rod 11 so that this portion of the rod 11 is of substantially semi-circular form in cross-section. The longitudinally extending lower edge portion 14 of this portion of the rod 11 is locatable within a notch 15 formed in the shank 6 of the cutting pick 7 (as shown in Fig. 2) whereby to prevent withdrawal of the pick 7 from the pick box body 1. The opposite side face of the shank 6 of the cutting pick 7 is also formed with a notch 15 so that the disposition of the pick 7 within the passage 4 may be reversed.

On either side of the passage 4 a portion of the rod 11 is formed with a flat 16, the flats 16 being substantially diametrically disposed. A bore 17 formed in the body 1 is in communication with each flat 16, the longitudinal axis of each bore 17 being substantially perpendicular to the associated flat 16 when the lower edge portion 14 of the rod 11 is located within the notch 15 in the shank 6 of the pick 7. Axially slid-

able within each bore 17 there is mounted a detent 18 which bears against the associated flat 16, the detents 18 being urged towards the flat 16 by a resiliently deformable member 19 formed of, for example, rubber or neoprene. As shown in Fig. 3 the detents 18 act on the flats 16 on both sides of the axis of rotation of the rod 11 so that the detents 18 urge the rod 11 to turn only until the flats 16 have attained an angular setting co-planar with the contacting end faces of the detents 18. In this setting the lower edge portion 14 is located within the notch 15 in the shank 6 of the pick 7.

The end portion of each bore 17 remote from the rod 11 may be of slightly larger diameter than the remainder of the bore 17 and is formed with screw threads with which an externally screw-threaded plug 20 is in engagement. The outer end face of the plug 20 is formed with a recess 21 with which a suitably formed tool, such as an Allen Key, may be engaged to facilitate insertion and withdrawal of the plug 20.

A hole 22 is formed in the body 1 between each bore 17, at the position at which the resiliently deformable member 19 is located, and a side face of the body 1. The member 19, if formed of rubber or neoprene and therefore not compressible, is partially displaced into the hole 22 during resilient deformation of the member 19.

If as shown in the drawings the angular setting of the flats 16 is the same as the angular setting of the flat 13 the bores 17 are upwardly inclined from the rod 11 towards the upper face of the body 1 but, as will be understood, if the flats 16 are at a different angular setting from the flat 13 the inclination of the bores 17 will be correspondingly altered without affecting the operation of the pick box.

The intended operative direction of travel of the pick box is indicated by the reference E.

With reference to the embodiments of the invention illustrated in Figs. 5, 6 and 7 the constructions differ only in the following respects from the construction as described above with reference to Figs. 1 to 4 inclusive, the same reference numerals having been used in Figs. 5, 6 and 7 as are used in Figs. 1 to 4 inclusive to denote similar parts.

Referring to Fig. 5 the resiliently deformable member 19 is disposed within a bore 23 formed in the body 1. The longitudinal axis of the bore 23 intersects and is disposed perpendicular to the longitudinal axes of the bores 17, the diameter of the bore 23 being greater than the diameter of the bores 17 where intersected by the bore 23. Furthermore in this embodiment of the invention the end portions of the bores 17 remote from the rod 11 are not screw-threaded and the screw-threaded plug is dispersed with.

As shown in Fig. 5 the detent 18 act on the flats 16 on the side of the axis of rotation of the rod 11 remote from the lower edge portion 14 so that the detent 18 continue to urge the rod 11 to turn even after the flats 16 have attained an angular setting co-planar with the contracting end faces of the detent 18, the result being that the lower edge portion 14 is not only located within the notch 15 in the shank 6 of the pick 7 but is urged against the surface of the notch 15 thereby reducing any tendency for the pick 7 to vibrate within the pick box. As will be appreciated this result will be secured in the embodiment illustrated in Figs. 1 to 4 inclusive and in the embodiment illustrated in Figs. 6 and 7 by arranging that in these embodiments the detent 18 act on the flats 16 on the side of the axis of rotation remote from the lower edge portion 14.

Referring to Figs. 6 and 7 the passage 4 formed in the body 1 and the shank 6 of the cutting pick 7 are of hexagonal form in cross-section, the bearing surfaces of the shank 6 and the passage 4 in the operative direction of travel E of the pick box being V-shaped thereby to prevent any vibration of the pick 7 within the body 1 and to maintain the pick 7 in the correct setting relative to the direction of travel E of the pick box. The latter advantage is, of course, not relevant if the head portion of the pick is of the type in which the operation of the pick is not affected by variations in the rotational setting of the pick. To mount the pick 7 in the passage 4 in the pick box body 1 the shank 6 of the pick 7 is, with reference to all the embodiments of the invention, inserted into the passage 4. The base of the shank 6 on contacting the flat 13 on the rod 11 exercises a cam action thereon which results, on further movement of the shank 6 into the passage 4, in the rod 11 being so turned against the influence of the resiliently deformable members 19 that the lower edge portion is withdrawn from the passage 4.

When the notch 15 on the shank 6 comes into alignment with the lower edge portion 14 the rod 11 turn in the opposite direction under the influence of the resiliently urged detents 18, to cause the lower edge portion 14 to enter into the notch 15 thereby securing the shank 6 of the pick 7 in the passage 4.

The pick 7 may alternatively be mounted in the passage 4 by turning the rod 11, using a tool engaged with the projection 12, until the lower edge portion 14 is withdrawn from the passage 4, by inserting the shank 6 in the passage 4, and by releasing the rod 11 which returns under the influence of the resiliently urged detents 18 until the lower edge portion 14 is located within the notch 15 in the shank 6.

To remove the pick 7 from the passage 4,

for example when the cutting edge 9 becomes damaged or excessively worn, the rod 11 is turned using the tool engaged with the projection 12 to withdraw the lower edge portion 14 from the notch 15 in the shank 6 and the pick 7 is withdrawn from the passage 4.

WHAT WE CLAIM IS:—

1. A pick box comprising a body formed with a passage within which the shank of a mineral cutting pick may be mounted, a rod rotatably journaled in bore which is formed in the body and which is in communication with the passage, the rod presenting means by which the rod may be turned, and at least one detent resiliently urged against a portion of the rod which is so formed that the rod is thereby urged towards an angular setting in which a further portion thereof protrudes into the passage for the shank of the cutting pick.

2. A pick box according to Claim 1, in which the or each detent is slidably mounted for axial movement within a further bore formed in the body and communicating with the bore in which the rod is rotatably journaled.

3. A pick box according to Claim 2, in which a resiliently deformable member is disposed within the further bore and is retained therein by a removable plug whereby resiliently to urge the detent against said portion of the rod.

4. A pick box according to Claim 2, in which a resiliently deformable member is disposed within a still further bore formed in the body whereby resiliently to urge the detent against said portion of the rod, the still further bore intersecting the further bore substantially at right angles.

5. A pick box according to Claim 4, in which the cross-sectional dimensions of the still further bore, and of the resiliently deformable member, are greater than the cross-sectional dimensions of the further bore at the position of intersection thereof.

6. A pick box as claimed in any of Claims 2, 3, 4, and 5, in which the further bore is of circular cross-section.

7. A pick box as claimed in either of Claims 4 and 5, in which the still further bore is of circular cross-section.

8. A pick box according to any of the preceding Claims in which the portion of the rod against which the detent is resiliently urged is formed with a flat and the detent acts on the flat only on the side of the axis of rotation of the rod remote from said further portion of the rod which may protrude into the passage for the shank of the cutting pick.

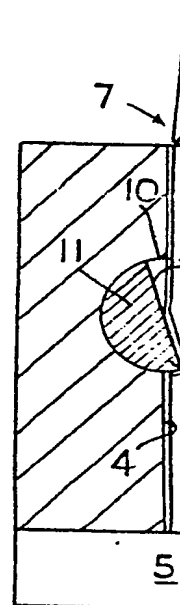
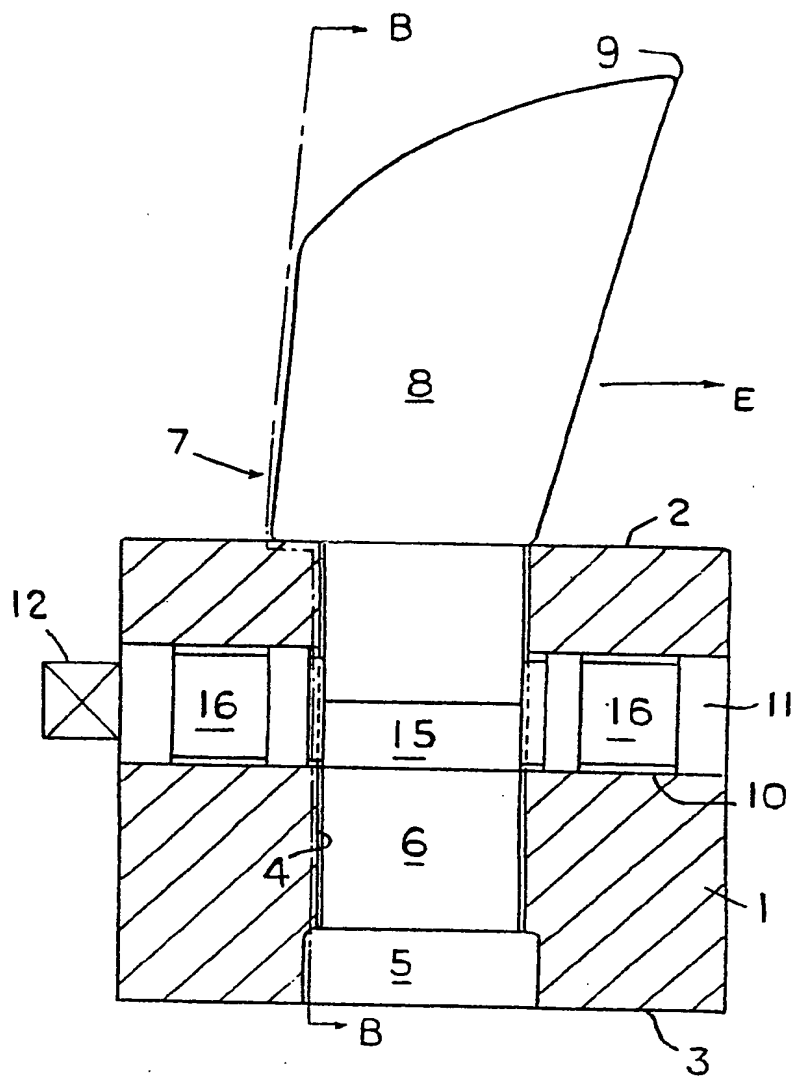
9. A pick box according to any of the preceding claims in which the passage formed in the body is of such cross-sectional

form that the leading face of the passage 4 inclusive, Fig. 5, or Figs. 6 and 7 of the
relative to the direction of travel of the pick accompanying drawings.
box when in use is of V-Shape.

10. A pick box constructed and arranged
5 substantially as herein described with
reference to and as illustrated in Figs. 1 to

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3 SHEETS

COMPLETE SPECIFICATION

*This drawing is a reproduction of
the Original on a reduced scale.*

SHEET 1

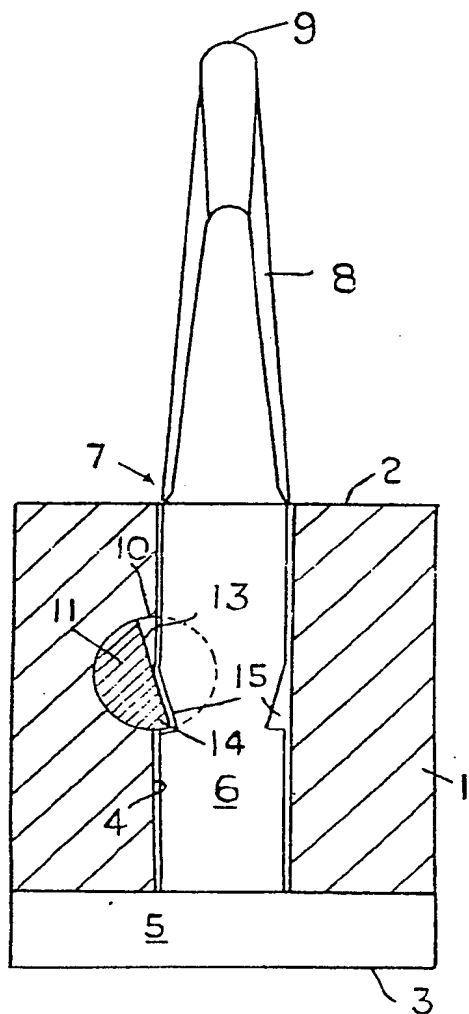


FIG. 2

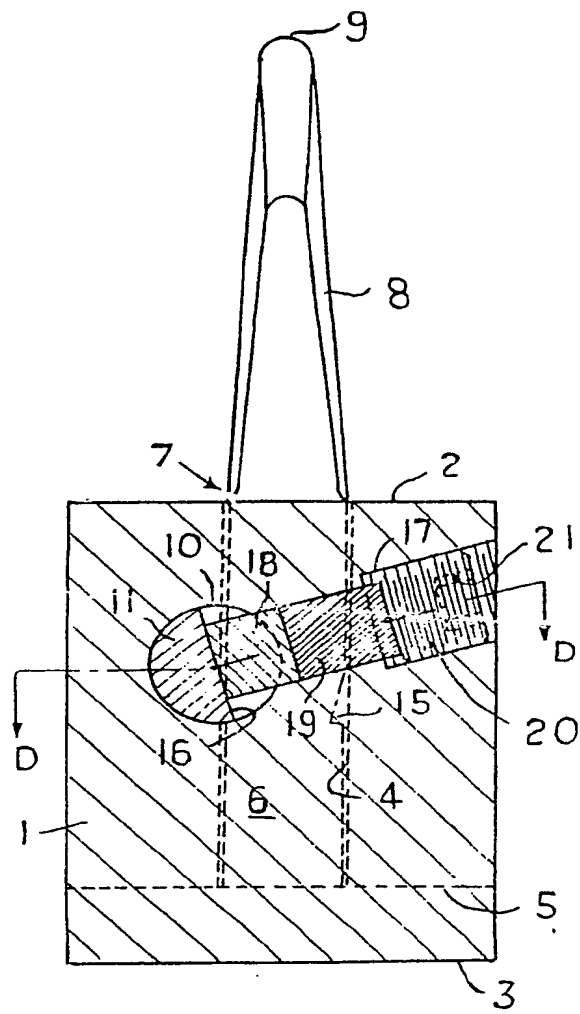
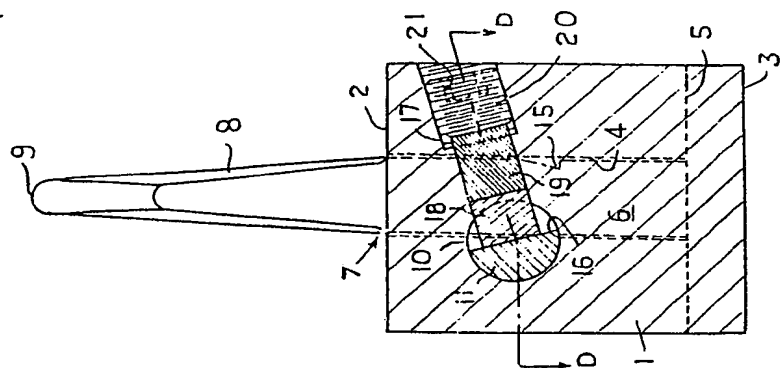
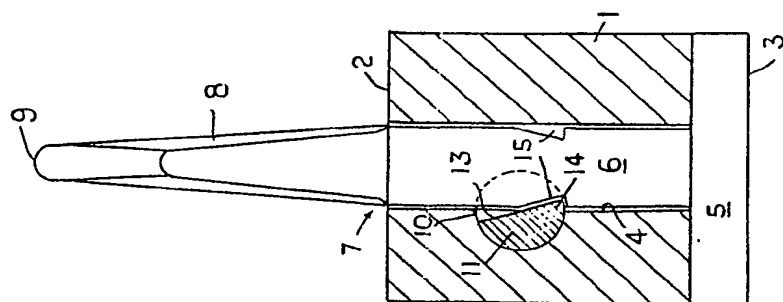
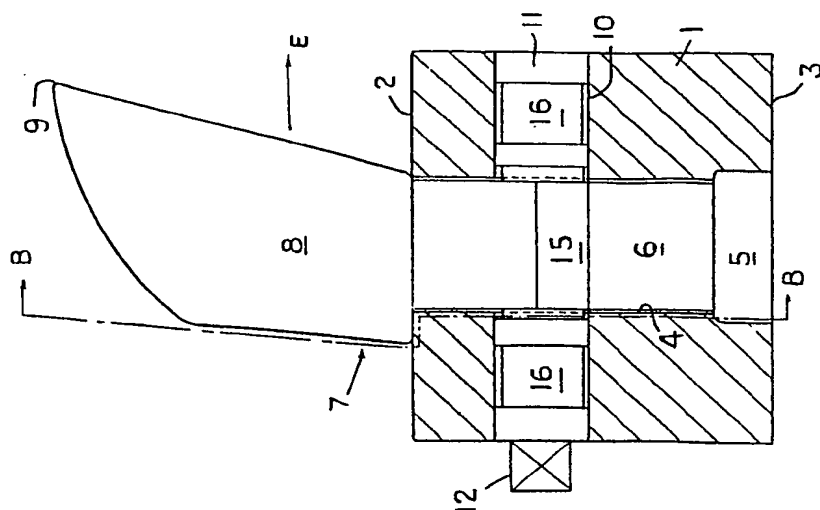
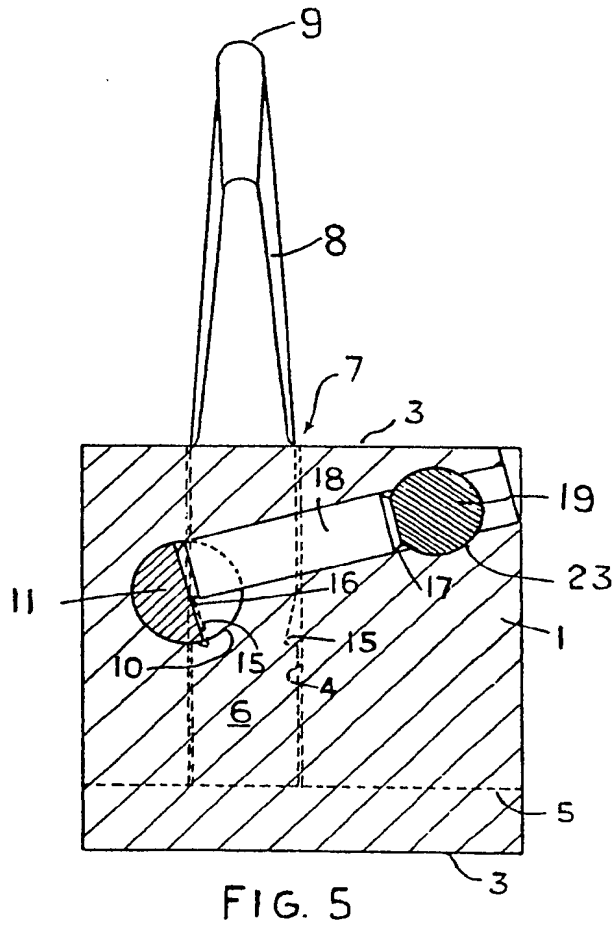
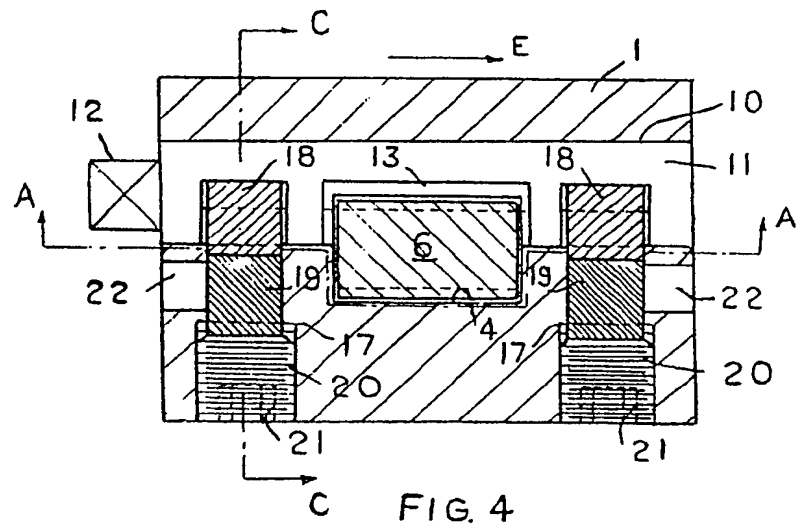


FIG. 3

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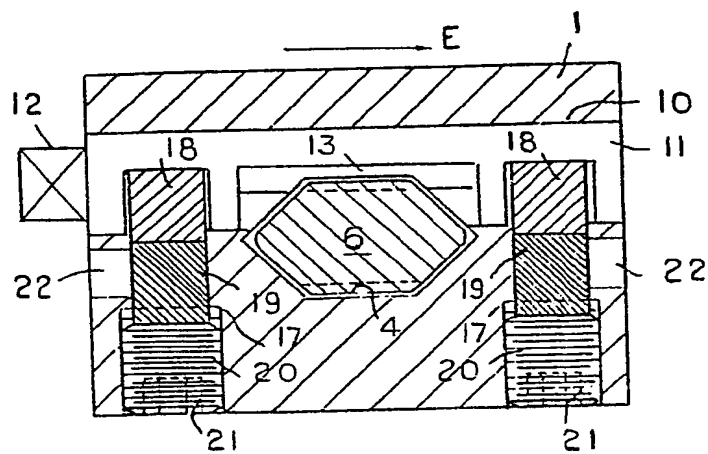
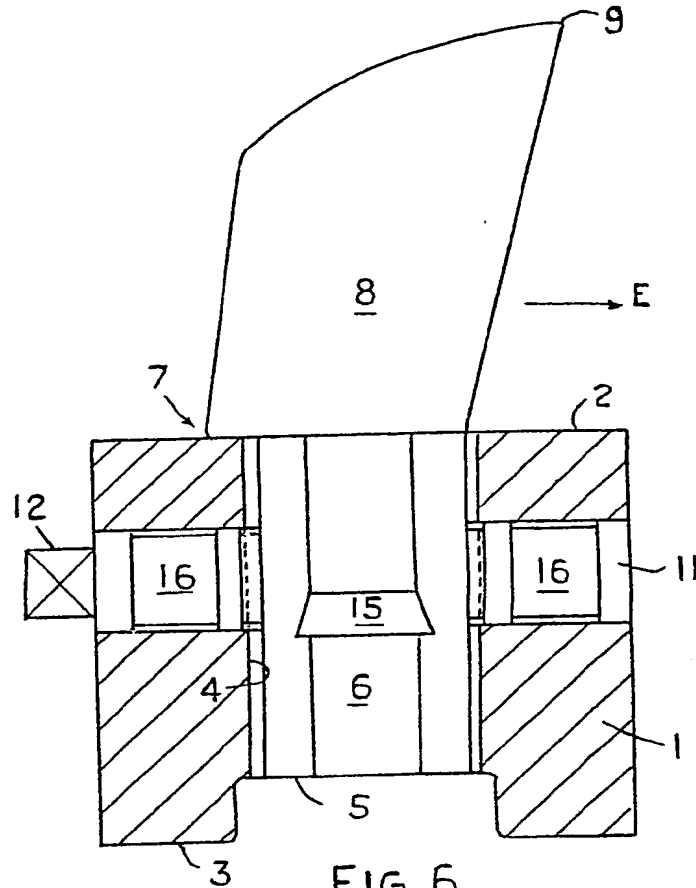
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3 SHEETS

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SHEETS 2 & 3



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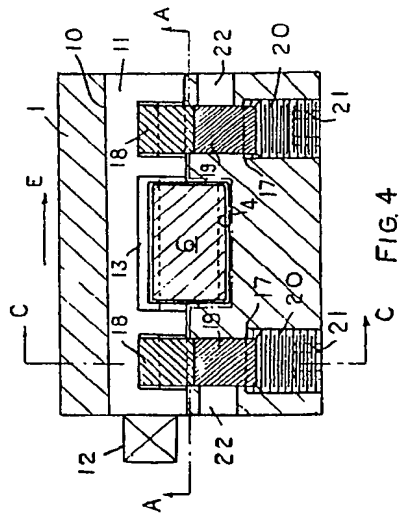


FIG. 4

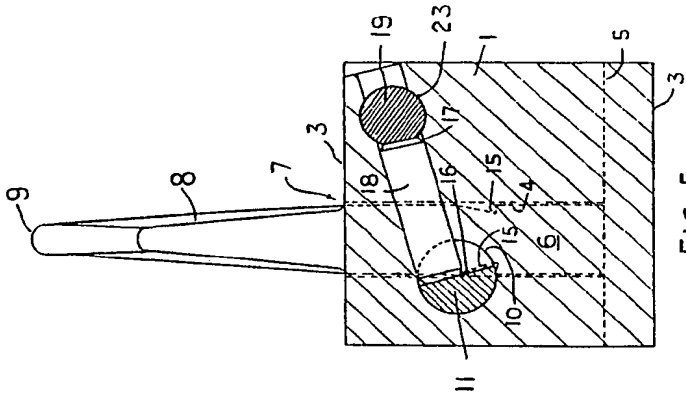


FIG. 5

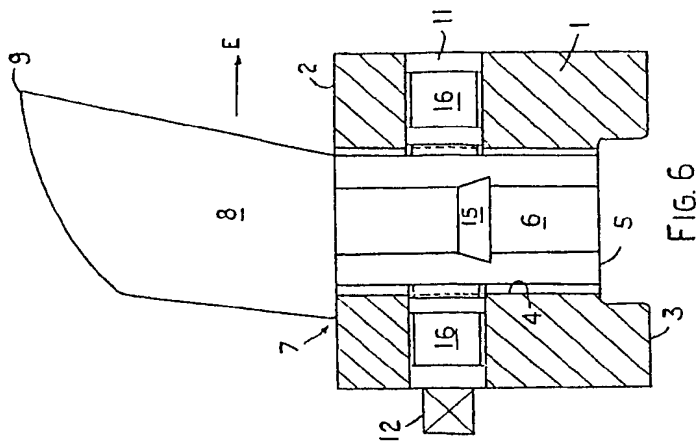


FIG. 6

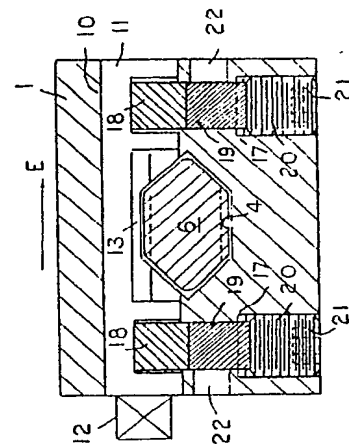


FIG. 7